



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx CSAE 24.0039X** Page 1 of 5 [Certificate history:](#)

Status: **Current** Issue No: 0

Date of Issue: 2025-05-20

Applicant: **Endress+Hauser SE+Co. KG**
Hauptstrasse 1
79689 Maulburg
Germany

Equipment: **Compact Line Vibronic sensor models Liquiphant FTL43 and FTL60**

Optional accessory:

Type of Protection: **Intrinsic Safety 'i'**

Marking: Ex ia IIC T4...T1 Ga
Ex ia IIC T4...T1 Ga/Gb

Ex ia IIIB T135°C Da
Ex ia IIIB T135°C Da/Db

Ex ia IIIB T135°C Da/ Ex ia IIC T4 Gb
Ex ia IIC T4 Ga/ Ex ia IIIB T135°C Db

Ex ic IIC T4...T1 Gc
Ex ic IIIB T135°C Dc

Approved for issue on behalf of the IECEx
Certification Body:

Michelle Halliwell

Position:

Senior Director of Operations

Signature:
(for printed version)

Date:
(for printed version)

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Certificate issued by:

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Hawarden, Deeside CH5 3US
United Kingdom





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Manufacturer: **Endress+Hauser SE+Co. KG**
Hauptstrasse 1
79689 Maulburg
Germany

Manufacturing
locations: **Endress+Hauser SE+Co. KG**
Hauptstrasse 1
79689 Maulburg
Germany

**Endress+Hauser (USA) Automation
Instrumentation Inc.**
2340 Endress Place
Greenwood , Indiana 46143
United States of America

**Endress+Hauser (Suzhou)
Automation Instrumentation Co. Ltd.**
China – Singapore Industrial Park
(SIP)
Su-Hong-Zhong-Lu, No. 491
Jiangsu Province, 215021 Suzhou
China

See following pages for more locations

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-11:2023 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:7.0

IEC 60079-26:2021 Explosive atmospheres - Part 26: Equipment with Separation Elements or combined Levels of Protection
Edition:4.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

GB/CSAE/ExTR25.0040/00

Quality Assessment Report:

DE/TUN/QAR06.0003/11



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The Liquiphant Compact Line devices FTL43 and FTL60 are point level switches for liquids and can be used for:
Maximum Working Pressure (MWP) up to 100 bar
Process temperatures up to 150°C.

The main differences for the FTL43 and the FTL60 is the application in where they are intended to be used:

-FTL43 is used for hygienic industrial applications with a maximum working pressure (MWP) up to 64bar and e.g., with a smaller surface roughness as the standard version of the Liquiphant Compact Line sensor.

-FTL60 is used for process industrial applications, with a maximum working pressure (MWP) up to 100bar and e.g., with the standard surface roughness of the Liquiphant Compact Line sensor.

To reduce the influence of the process temperature, it is possible that the sensor is available with a temperature spacer which is outside of the process (vessel). The sensor length (inside the process / vessel) can vary between a compact, short or an extended sensor length up to 1.5m for the standard device and up to 6m for a customer specific length (depend on the switching point of the sensor required by the customer).

Measuring Principle:

For point level detection in liquids a sensor in form of a tuning fork is excited at its resonant frequency. The drive works piezoelectrically. The oscillating frequency changes as the fork enters the medium. The change is analyzed and translated into a switching signal.

The Compact Line Liquiphant devices FTL43 / FTL60 uses Ex component of the Compact Platform Electronics (device enclosure, visual unit, terminal unit, main unit (e.g. MA20: HART) certified under IECEx CSA 24.0035U and Ex sensor specific component (e.g. sensor electronic EA22-01A, Liquiphant piezo sensor SV20-XXX and different process connections) certified under IECEx CSAE 24.0046U .

The FTL43 and FTL60 enclosure [HY20-03A] consists of the following parts:

- Metallic Cover with plastic window unit part, which covers the LED module (VA22-01A)
- Metallic Housing unit part with M12 connector for the input power, which contains:
 - Terminal Electronic (2-wire) [TA20-01A] with its Terminal housing for Ex-ia HART
 - Electronic plastic box which contains the Main electronics 2 wire [MA20-01A] and sensor electronics [EA22-01] under potting
- Metallic Housing adapter for the SV20-XXX sensor
- Metallic Sensor SV20-XXX which could be of three types:
 - Compact sensor
 - Sensor with tube extension
 - Compact sensor with temperature spacer with/without pressure tight feed through

The metallic cover with the housing and with the adapter and with the sensor parts are full welded together and form a fully enclosed enclosure and evaluated entirely as intrinsically safe Ex ia IIC with entity parameters and also evaluated for different zones separations and as Single seal device as per listed standards.

The entity parameters at the M12 connector, in type of protection Ex ia IIC or Ex ic IIC:

Ui = 30 V li = 100 mA Pi = 700 mW Ci = 15nF Li = 0.69 mH

In type of protection Ex ia IIIB or Ex ic IIIB:

Ui = 30 V li = 100 mA Pi = 650 mW Ci = 15nF Li = 0.69 mH

For ordering codes see annexe

SPECIFIC CONDITIONS OF USE: YES as shown below:

See annexe for Specific Conditions of Use



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Equipment (continued):

See annexe for Conditions of Manufacture



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Additional manufacturing locations:

**Endress+Hauser Flowtec (Brazil)
Fluxômetros Ltda.**
Estrada Municipal Antônio Sesti,
600 Bairro Recreio Costa Verde
Itatiba, SP - 13254-085
Brazil

Endress+Hauser Yamanashi Co., Ltd
862-1 Mitsukunugi Sakaigawa-cho
Fuefuki-shi Yamanashi Pref. 406-0846
Japan

**Endress+Hauser (India) Automation
Instrumentation Pvt. Ltd.**
M-192, Waluj MIDC
Maharashtra State
Chhatrapati Sambhajnagar (former
Aurangabad) 431 136
India

Annex:

[IECEX CSAE 24.0039X Issue 0 Annexe.pdf](#)

EQUIPMENT (continued)

Ordering Codes

	FTL	43	60	-aa bb c d e f g h ii jj kkk + ll mm nn oo pp qq rr yy
aa=10				Approval:
	BA	X	X	ATEX/IEC II 1G Ex ia IIC T4 Ga
	BB	X	X	ATEX/IEC II 1/2G, 2G Ex ia IIC T4 Ga/Gb
	BH	X	X	ATEX/IEC II 1D Ex ia IIIB Da
	BI	X	X	ATEX/IEC II 1G Ex ia IIC T4 Ga, II 1D Ex ia IIIB Da
	BK	X	X	ATEX/IEC II 1/2G, 2G Ex ia IIC T4 Ga/Gb, II 1/2D, 2D Ex ia IIIB Da/Db
	BT	X	X	IEC II 3D Ex ic IIIB Dc
	BU	X	X	IEC II 3G Ex ic IIC T4 Gc
bb=20				Output:
	BA	X	X	2-wire 4-20mA (8/16mA) HART
c=30				Display; Operation:
	B	X	X	LED
	C	X	X	LED with control button
	D	X	X	LED with control button + Bluetooth
	Y	X	X	Modification of the above named option in (e.g. colour of LED). Not relevant for explosion protection.
d=40				Housing; Material:
	F	X	X	Compact; 316L
e=50				Electrical Connection:
	N	X	X	Plug M12, IP66/68/69 NEMA Type 4X/6P
	Y	X	X	Modification of the above mentioned option. Not relevant for explosion protection.
				Application
f=60	A	X	X	Process max 150oC/302oF, max 64bar
	B		X	Process max 150oC/302oF, max 100bar
	Y	X	X	Modification of the above mentioned option. Not relevant for explosion protection.
g=80				Surface Refinement:
	A	X		Standard Ra<1.5µm/59uin
	A		X	Standard Ra<3.2µm/126uin
	B	X		Hygienic Ra<0.76 µm/30 µin
	D	X		Hygienic Ra<0.3µm/12uin mech. polished
	E	X		Hygienic Ra<0.38µm/15uin electropolished
	Y	X	X	Modification of the above mentioned option (e.g. different Ra). Not relevant for explosion protection.
h=85				Type of Probe:
	1	X	X	Compact version
	2	X	X	Tube extension
	3	X	X	Short tube version
	9	X	X	Modification of the above mentioned option (e.g. shorter than standard version, probe angled). Not relevant for explosion protection.
ii=90				Sensor Length; Material:
	AC		X	Compact version; AlloyC22

Annexe to: IECEx CSAE 24.0039X Issue 0

Applicant: Endress+Hauser SE+Co. KG

Apparatus: Compact Line Vibronic sensor models Liquiphant FTL43 and FTL60



	FTL	43	60	-aa bb c d e f g h ii jj kkk + ll mm nn oo pp qq rr yy
	AJ	X	X	Compact version; 316L
	BC		X	Short tube version; AlloyC22
	BJ	X	X	Short tube version; 316L
	BL	X		153 mm L, Ra<1.5µm/59µin; 316L
	BS	X		253 mm L, Ra<1.5µm/59µin; 316L
	BL		X	153 mm L, Ra<3.2µm/126µin; 316L
	BS		X	253 mm L, Ra<3.2µm/126µin; 316L
	CC		X	..... mm L, Ra<3.2µm/126µin; AlloyC22
	CJ		X	..... mm L, Ra<3.2µm/126µin; 316L
	CJ	X		..... mm L, Ra<1.5µm/59µin; 316L
	DC		X	..... inch L, Ra<3.2µm/126µin; AlloyC22
	DJ		X	..... inch L, Ra<3.2µm/126µin; 316L
	FJ	X		..... mm L, Ra<0.3µm/12µin; 316L
	GJ	X		..... mm L, Ra<0.38µm/15µin electro polished; 316L
	KJ	X		..... inch L; Ra<1.5µm/59µin; 316L
	MJ	X		..... inch L; Ra<0.3µm/12µin; 316L
	NJ	X		..... inch L; Ra<0.38µm/15µin electro-polished; 316L
	YY	X	X	Modification of one of the above mentioned options (max. L=6m, e.g. material Duplex steel, different Alloy-C-version). Not relevant for explosion protection.
jj=105				Process connection, Sealing Surface:
	##	X	X	Standard industrial process connection: threaded, flange (e.g. Varivent, Clamp/Tri-Clamp, Thread EN10226 (R), Thread ISO228 (G),...)
	99	X	X	Modification of one of the above mentioned options (customer specific connections). Not relevant for explosion protection.
kkk=110				Process Connection:
	###	X	X	Standard industrial process connection: flanges, threaded, flush mount diaphragm seal, 316L, Alloy C22
	9YY	X	X	Modification of one of the above mentioned options (customer specific connections). Not relevant for explosion protection.
ll=540				>>Application Package:
	EH	X	X	Heartbeat Verification + Monitoring
	E9	X	X	Modification of one of the above mentioned options (customer specific variant). Not relevant for explosion protection.
mm=570				>>Service:
	##	X	X	Representing different services like cleaned from oil + fat, cleaned for Oxygen applications, settings to the device different from delivery standard or product documentation on paper, etc.. Not relevant for explosion protection.
	I9	X	X	Special version (only modification by firmware) not given in the standard order code. Examples: Switch Point, Switch Time or Switch Density, Foam Detection. Not relevant for explosion protection.
nn=580				>>Test, Certificate, Declaration:
	##	X	X	Material certificates wetted metallic parts, pressure test, leakage test, PMI-test. Not relevant for explosion protection.
	K9	X	X	Modification of one of the above mentioned options: Customer specific variant. Not relevant for explosion protection.
oo=590				>>Additional Approval:
	##	X	X	Additional approvals, no influence to explosion protection; e.g.: SIL, WHG, Ship building, drinking water, CRN. Not relevant for explosion protection.

Date: 20 May 2025

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Unit 6 Hawarden Industrial Park,
Hawarden Deeside CH5 3US, UK.



	FTL	43	60	-aa bb c d e f g h ii jj kkk + ll mm nn oo pp qq rr yy
	L9	X	X	Modification of one of the above mentioned options: Further approvals. Not relevant for explosion protection.
pp=600				>Sensor Design:
	MR	X	X	Temperature spacer
	MS	X	X	Temperature spacer + Pressure tight feed through (Second line of defence)
	M9	X	X	Modification of one of the above mentioned options or special sensor version not given in the standard order code: Shorter, Longer or Angled version of the sensor tube. Not relevant for explosion protection.
qq=620				>>Accessory Enclosed:
	##	X	X	Not part of the approval, because only enclosed parts. Example: Accessory can be a weld-in adapter, plug connector M12 with/without cable. M12 made in plastic or metal with different
rr=850				>Firmware Version
	##	X	X	Representing different firmware versions. Not relevant for explosion protection.
yy=895				>>Marking:
	Zx	X	X	Tagging acc. customer order. Not relevant for explosion protection.

Specific Conditions of Use (continued)

1. In applications where the process temperature exceeds the temperature class, the hot surface ignition at the process connecting parts of the device shall be monitored.
2. To avoid electrostatic charging in explosive atmospheres, avoid rubbing of the non-metallic surfaces using electrostatic generating materials. Do not use the device in applications with moving dust atmosphere causing electrostatic charging.
3. It is essential for the device to use a power supply that is galvanically isolated from earth.
4. When using an intrinsically safe barrier, the barrier must be connected to the same earth as the device.
5. Maximum working pressure (MWP) for model FTL 43 is 64 bar and for FTL 60 is 100 bar.
6. Pipe/tube extension version is max. 6m and was included in the intrinsically safe evaluation.
7. Only the surface roughness with the order code g (080) = A for FTL43 and FTL60 can be used for EPL Da/Gb and EPL Ga/Db applications.
8. The FTL 43/60 models with surface roughness with the order code g (080) = D, E shall not be exposed to environmental, chemical or physical factors that could affect the partition.
9. The process connection including sealing should maintain a tight joint as IP66 or IP67 according to IEC 60529 under the max process pressure conditions.
10. The FTL 43/60 device has to be installed within a maximum range of the ambient $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +70^{\circ}\text{C}$ and a maximum process temperature of 150°C but there is an ambient and process temperature derating depending on the Zones and the EPL of installation as shown below:



Marking: Ex ia IIC T4 Ga or Ex ia IIC T4 Ga/Gb or Ex ic IIC T4...T1 Gc

Entity parameters: $U_i = 30\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 700\text{ mW}$ T_p -Process temperature (EPL Ga) T_a -Ambient temperature ((EPL Ga or EPL Gb)

Device + Sensor configuration	Temperature class	P1		P2		P3		P4		P5		Unit
		T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	
	T4	-40	70	80	70	125	50	125	-40	-40	-40	°C
	T3...T1	-40	70	80	70	140 150	40 30	150	-40	-40	-40	

Device + T_{spacer} + Sensor configuration	Temperature class	P1		P2		P3		P4		P5		Unit
		T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	
	T4	-40	70	80	70	125	60	125	-40	-40	-40	°C
	T3...T1	-40	70	80	70	150	60	150	-40	-40	-40	

Marking: Ex ia IIIB T135°C Da

Entity parameters: $U_i = 30\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 650\text{ mW}$

Device + sensor with/without temperature spacer (T_{spacer}).	EPL Da Process temperature (T_p) [°C]	EPL Da Ambient temperature (T_a) [°C]	Marking surface temperature (device + sensor)	Remark
	$-40 \leq T_p \leq 70$	$-40 \leq T_a \leq 70$	T135°C	For EPL Da in Zone 20 a dust immersion or dust layer is permitted acc. IEC 60079-11:2021 cl. 5.4.5

Marking: Ex ia IIIB T135°C Da/Db

Entity parameters: $U_i = 30\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 650\text{ mW}$

Device + Sensor configuration	EPL Da Process temperature (T_p) [°C]	EPL Db (Dc) Ambient temperature (T_a) [°C]	Marking surface temperature (device + sensor)	Remark
	$-40 \leq T_p \leq 70$	$-40 \leq T_a \leq 70$	T135°C	Da/Db à Same as for a EPL Da.

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Applicant: Endress+Hauser SE+Co. KG

Apparatus: Compact Line Vibronic sensor models Liquiphant FTL43 and FTL60



Marking: Ex ia IIIB T135°C Da/Db

Entity parameters for the device input: $U_i = 30\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 650\text{ mW}$

Device + T_{spacer} + Sensor configuration	EPL Da	EPL Db (Dc)	Marking	Remark
	Process temperature (T_p) [°C]	Ambient temperature (T_a) [°C]	surface temperature (device + sensor)	
	$-40 \leq T_p \leq 100$	$-40 \leq T_a \leq 45$	T135°C	<u>Zone 20:</u> For EPL Da in Zone 20 a dust immersion or dust layer is permitted acc. IEC 60079- 11:2021 cl. 5.4.5 <u>Zone 21:</u> For the EPL Db in Zone 21 (EPL Db assumed as Da) <u>only</u> <u>a dust cloud</u> , but no dust layer is permitted The enclosure is rated as IP 66/68 acc. IEC 60529.
	$-40 \leq T_p \leq 70$	$-40 \leq T_a \leq 70$		<u>Zone 20:</u> For EPL Da (EPL Db assumed as Da) in Zone 20 (Zone 21) a dust immersion or dust layer is permitted acc. IEC 60079- 11:2021 cl. 5.4.5. Same as for EPL Da

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Apparatus: Compact Line Vibronic sensor models Liquiphant FTL43 and FTL60



Marking: Ex ia IIIB T135°C Da / Ex ia IIC T4 Gb Entity parameters: $U_i = 30\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 700\text{ mW}$				
Device + Sensor configuration with/without T_{spacer}	EPL Da Process temperature (T_p) [°C]	EPL Gb Ambient temperature (T_a) [°C]	Marking max. Surface temperature and T-class	Remark
	$-40 \leq T_p \leq 100$	$-40 \leq T_a \leq 60$	<u>EPL Da (Zone 20):</u> T135°C <u>EPL Gb (Zone 1):</u> T4	For EPL Da in Zone 20 a dust immersion or dust layer is permitted acc to IEC 60079- 11:2021 Cl.5.4.5 <u>For EPL Gb the limit is T4 which is fulfilled with the T_p and T_a</u>

Marking: Ex ia IIC T4 Ga / Ex ia T135°C IIIB Db Entity parameters: $U_i = 30\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 650\text{ mW}$				
Device + Sensor configuration	EPL Ga Process temperature (T_p) [°C]	EPL Db Ambient temperature (T_a) [°C]	Marking max. Surface temperature and T-class	Remark
	$-40 \leq T_p \leq 70$	$-40 \leq T_a \leq 70$	<u>EPL Ga (Zone 0):</u> T4 <u>EPL Db (Zone 21):</u> T135°C	Zone 21: For the EPL Db <u>no dust layer is permitted, only a dust cloud</u> The enclosure is rated as IP 66/68 acc. IEC 60529.

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Device + T _{spacer} + Sensor configuration	EPL Ga Process temperature (T _p) [°C]	EPL Db Ambient temperature (T _a) [°C]	Marking max. Surface temperature and T-class	Remark
	-40 ≤ T _p ≤ 125 (125°C is the limit for T4)	-40 ≤ T _a ≤ 40	EPL Ga (Zone 0): T4	Zone 21: For the EPL Db <u>no dust layer is permitted, only a dust cloud</u> The enclosure is rated as IP 66/68 acc. IEC 60529.
	-40 ≤ T _p ≤ 70	-40 ≤ T _a ≤ 70	EPL Db (Zone 21,22): T135°C	

Conditions of Manufacture

1. Routine test for the encapsulant and for the conformal coating for the complete device FTL 43/60 has to be conducted as per E+H procedure to comply with IEC 60079-11 Ed. 7 Cl 10.4.
2. The products covered by this certificate incorporate previously certified devices as shown below in the table, it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices, and the manufacturer shall inform CSA Group of any modifications of the devices that may impinge upon the explosion safety design of their products.

Component	Model	Certificate or Report	Standards
Enclosure	HY20-** & HY21-** Series	CSA report number 80184761, dated March 07, 2024	CSA C22.2 No. 94.2:20 Third Edition & ANSI/UL 50E Third Edition, October 15, 2020
Platform Electronics	Compact Platform, consisting of modules TA20-01A, MA20-01A, VA20-01A, VA20-02A and VA22-01A	IECEx CSA 24.0035U issue 0	IEC 60079-0, edition 7.0 IEC 60079-11, edition 7.0
Liquiphant Sensor Component.	EA22-01A+SV20-xxx	IECEx CSAE 24.0046U issue 0	IEC 60079-0, edition 7.0 IEC 60079-11, edition 7.0 IEC 60079-26:2021 Ed. 4